Installation & Maintenance Instructions

2–WAY INTERNAL PILOT–OPERATED SOLENOID VALVES
NORMALLY CLOSED OPERATION — GENERAL SERVICE
3/8″, 1/2″ OR 3/4″ NPT

REBUILD KIT
No. 54187 and 56161
Form No.V7436

NOTICE: See separate solenoid installation and maintenance instructions for information on: Wiring, Solenoid Temperature, Cause of Improper Operation, Coil or Solenoid Replacement.

DESCRIPTION

These valves are 2–way normally closed internal pilot–operated solenoid valves designed for general service. Valves are made of rugged forged brass and provided with a general purpose solenoid enclosure.

OPERATION

Normally Closed: Valve is closed when solenoid is de–energized; open when energized.

IMPORTANT: Minimum operating pressure differential required is 5 psi.

Manual Operator (optional feature)

Manual operator allows manual operation when desired or during an electrical power outage. To engage manual operator (open the valve), push in knurled cap and rotate stem clockwise 180°. Valve will now be in the same position as when the solenoid is energized. To disengage manual operator (close the valve), turn stem counterclockwise 180°.

Push in and rotate
180°clockwise to operate

⚠ CAUTION: For valve to operate electrically, manual operator stem must be fully rotated counterclockwise.

Relocation of Manual Operator

Manual operator may be relocated at 90° increments by rotating the valve bonnet as follows:

⚠ WARNING: To prevent the possibility of death, serious injury or property damage, turn off electrical power, depressurize valve, and vent fluid to a safe area before relocating manual operator.

1. See separate solenoid installation and maintenance instruction's and follow instructions to loosen solenoid to allow rotation of enclosure.
2. Be sure manual operator stem is fully rotated counterclockwise.
3. Remove bonnet screws from valve body.
4. Lift valve bonnet slightly and rotate to desired position. Do not rotate the diaphragm assembly with the valve bonnet.
5. Replace bonnet screws and torque in a crisscross manner to 95 ± 10 in–lbs [10,7 ± 1,1 Nm].
6. Position and tighten solenoid in place, see separate instructions.

⚠ WARNING: To prevent the possibility of death, serious injury or property damage, check valve for proper operation before returning to service.

7. Test operate valve electrically and manually. Be sure valve can be test operated without effecting other equipment.
8. Restore line pressure and electrical power supply to valve.

INSTALLATION

Check nameplate for correct catalog number, pressure, voltage, frequency, and service. Never apply incompatible fluids or exceed pressure rating of the valve. Installation and valve maintenance to be performed by qualified personnel.

Future Service Considerations

Provision should be made for performing seat leakage, external leakage, and operational tests on the valve with a nonhazardous, noncombustible fluid after disassembly and reassembly.

Temperature Limitations

For maximum valve ambient and fluid temperatures, refer to chart below. Check catalog number and watt rating on nameplate.

Watt Rating / AC or DC	Catalog Number Prefix	Solenoid Class	Max. Amb. Temp. °F	Max. Fluid Temp. °F
6 / AC	None or DF	F	122	180
	HT	H	140	180
6.1 / AC	None, KF, SF, or SC	F	125	180
	HT, KH, ST or SU	H	140	180
11.2 / DC	None or HT	F or H	77	150
11.6 / DC	None, HT, KF, KH, SC, SF or ST	F or H	104	150

Positioning

This valve is designed to perform properly when mounted in any position. However, for optimum life and performance, the solenoid should be mounted vertically and upright to reduce the possibility of foreign matter accumulating in the solenoid base sub–assembly area.

Mounting

For mounting bracket (optional feature) dimensions, refer to Figure 1.

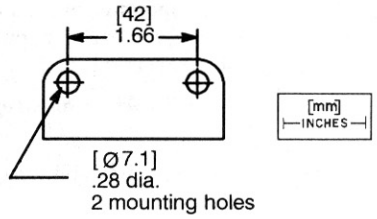

Figure 1. Mounting bracket dimensions

Piping

Connect piping to valve according to markings on valve body. Apply pipe compound sparingly to male pipe threads only. If applied to valve threads, the compound may enter the valve and cause operational difficulty. Avoid pipe strain by properly supporting and aligning piping. When tightening the pipe, do not use valve or solenoid as a lever. Locate wrenches applied to valve body or piping as close as possible to connection point.

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⚠ CAUTION: To protect the solenoid valve, install a strainer or filter suitable for the service involved in the inlet side as close to the valve as possible. Clean periodically depending on service conditions.

MAINTENANCE

⚠ WARNING: To prevent the possibility of death, serious injury or property damage, turn off electrical power, depressurize valve, and vent fluid to a safe area before servicing the valve.

NOTE: It is not necessary to remove the valve from the pipeline for repairs.

Cleaning

All solenoid valves should be cleaned periodically. The time between cleanings will vary depending on the medium and service conditions. In general, if the voltage to the coil is correct, sluggish valve operation, excessive noise or leakage will indicate that cleaning is required. In the extreme case, faulty valve operation will occur and the valve may fail to open or close. Clean strainer or filter when cleaning the valve.

Preventive Maintenance

- Keep the medium flowing through the valve as free from dirt and foreign material as possible.
- While in service, the valve should be operated at least once a month to insure proper opening and closing.
- Depending on the medium and service conditions, periodic inspection of internal valve parts for damage or excessive wear is recommended. Thoroughly clean all parts. If parts are worn or damaged, install a complete rebuild kit.

Causes of Improper Operation

- **Incorrect Pressure:** Check valve pressure. Pressure to valve must be within range specified on nameplate.
- **Excessive Leakage:** Disassemble valve and clean all parts. If parts are worn or damaged, install a complete rebuild kit.

Valve Disassembly

1. Disassemble valve in an orderly fashion using exploded views for identification and placement of parts. Refer to Figure 2 for AC construction; Figure 3 for DC construction.
2. Remove solenoid enclosure. See separate instructions.

- ***For AC construction (standard or with manual operator), proceed as follows:***

3. For standard construction, remove bonnet screws, solenoid base sub–assembly, core spring, core assembly, diaphragm spring, diaphragm assembly and body gasket from valve body.
4. For manual operator constructions, unscrew solenoid base sub–assembly first then follow step 3 for removal of parts.
5. For normal maintenance (cleaning) it is not necessary to disassemble the manual operator unless a rebuild kit is being installed. To disassemble, remove stem pin, manual operator stem, stem spring and stem gaskets (2).

- ***For DC construction (standard or with manual operator), proceed as follows:***

6. Unscrew solenoid base sub–assembly first then follow step 3 and 5 for removal of parts.

Note: Diaphragm spring is omitted for DC construction.

7. All Parts are now accessible for cleaning or replacement. If parts are worn or damaged, install a complete rebuild kit.

Valve Reassembly

1. Lubricate body gasket and solenoid base gasket with DOW CORNING® 200 Fluid lubricant or an equivalent high–grade silicone fluid.
2. Lubricate manual operator stem gaskets (2) with DOW CORNING® 111 Compound lubricant or an equivalent high–grade silicone grease.
3. Replace body gasket and diaphragm assembly. Locate bleed hole in diaphragm assembly approximately 45° from valve outlet.

- ***For AC construction (standard or with manual operator), proceed as follows:***

4. Position diaphragm spring on diaphragm assembly. Be sure ***large end*** of diaphragm spring seats in cup of diaphragm assembly. For manual operator constructions, ***small end*** of diaphragm spring seats in cup of diaphragm assembly.
5. Install wide end of core spring in core assembly first, closed end protrudes from top of core assembly.
6. For standard construction, position core assembly with core spring and solenoid base sub–assembly (integral with bonnet) over diaphragm spring and diaphragm assembly.
7. Install bonnet screws and hand thread screws as far as possible, then torque bonnet screws in a crisscross manner to 95 ± 10 in–lbs [10,7 ± 1,1 Nm].
8. For valve constructions with a manual operator, first install valve bonnet and bonnet screws as described in step 7.
9. Install solenoid base gasket, core assembly with core spring and solenoid base sub–assembly.
10. Torque solenoid base sub–assembly to 175 ± 25 in–lbs [19,8 ± 2,8 Nm].
11. For valves with a manual operator proceed as follows:
    A. Install two manual operator stem gaskets on stem. Refer to Step 2 for lubrication instructions.
    B. Install stem spring and stem assembly with gaskets into valve bonnet.
    C. Push stem assembly into valve bonnet; align stem pin hole and install stem pin.
    D. Operate manual operator to be sure there is no misalignment or binding. Then rotate manual operator stem counterclockwise as far as possible.

- ***For DC construction (standard or with manual operator), proceed as follows:***

12. For standard or manual operator constructions, replace valve bonnet and follow steps 7, 9 and 10. For manual operator constructions, install core spring in core assembly following step 5.
13. Install solenoid. See separate instructions.

⚠ WARNING: To prevent the possibility of death, serious injury or property damage, check valve for proper operation before returning to service. Also perform internal seat and external leakage tests with a nonhazardous, noncombustible fluid.

14. Restore line pressure and electrical power supply to valve.
15. After maintenance is completed, operate the valve a few times to be sure of proper operation. A metallic *click* signifies the solenoid is operating.

ORDERING INFORMATION FOR . REBUILD KITS

Parts marked with an asterisk (*) in the exploded view are supplied in Rebuild Kits. When Ordering Rebuild Kits for valves, order the Rebuild Kit number stamped on the valve nameplate. If the number of the kit is not visible, order by indicating the number of kits required, and the Catalog Number and Serial Number of the valve(s) for which they are intended.

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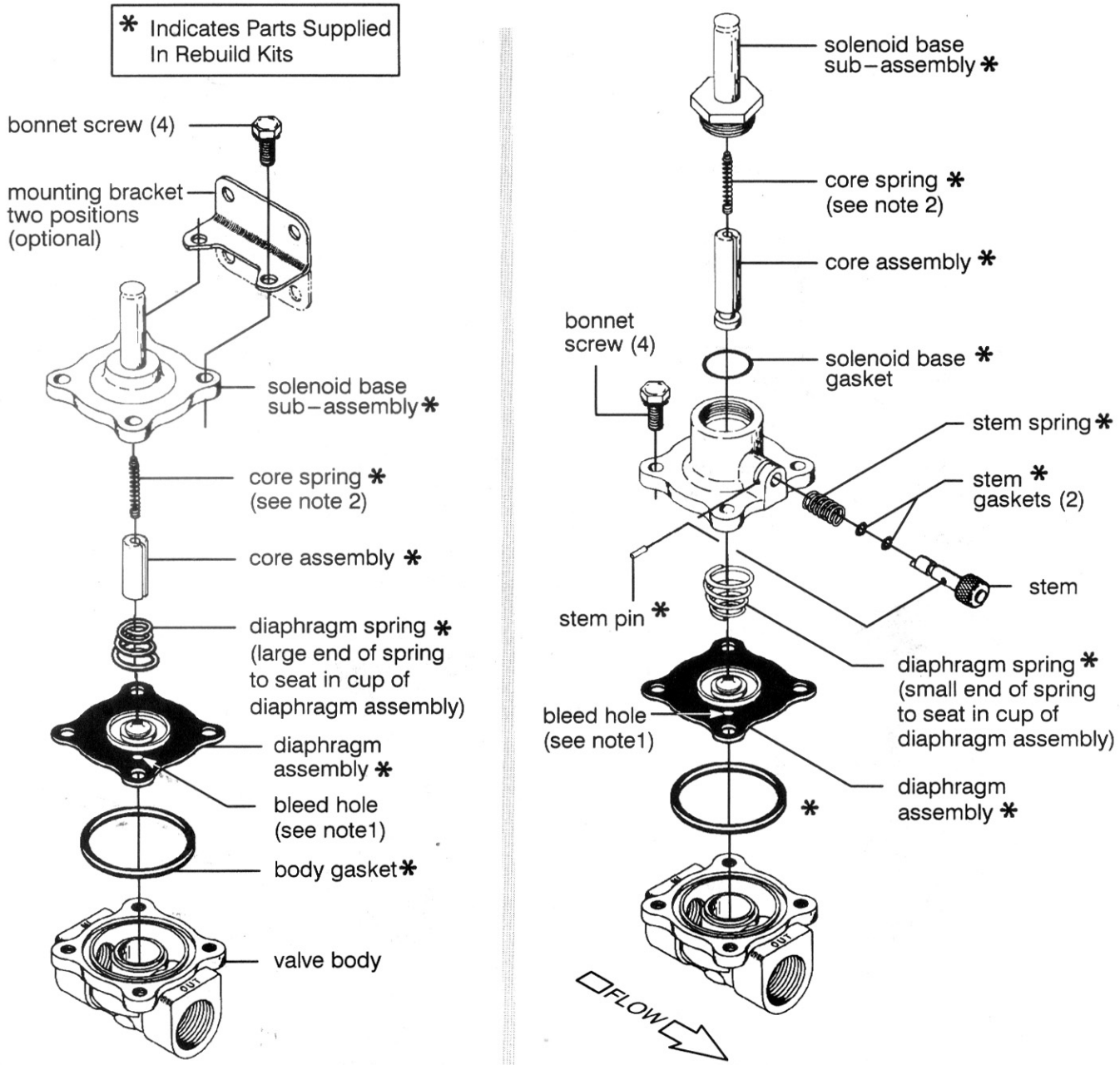
Torque Chart

Part Name	Torque Value Inch–Pounds	Torque Value Newton–Meters
Solenoid base sub–assembly	175 ± 25	19,8 ± 2,8
Bonnet screws	95 ± 10	10,7 ± 1,1



Note:

1. Locate bleed hole in diaphragm assembly approximately 45° from valve outlet.
2. Wide end of core spring in core first, closed end protrudes from top of core.

Figure 2. AC construction without solenoid.

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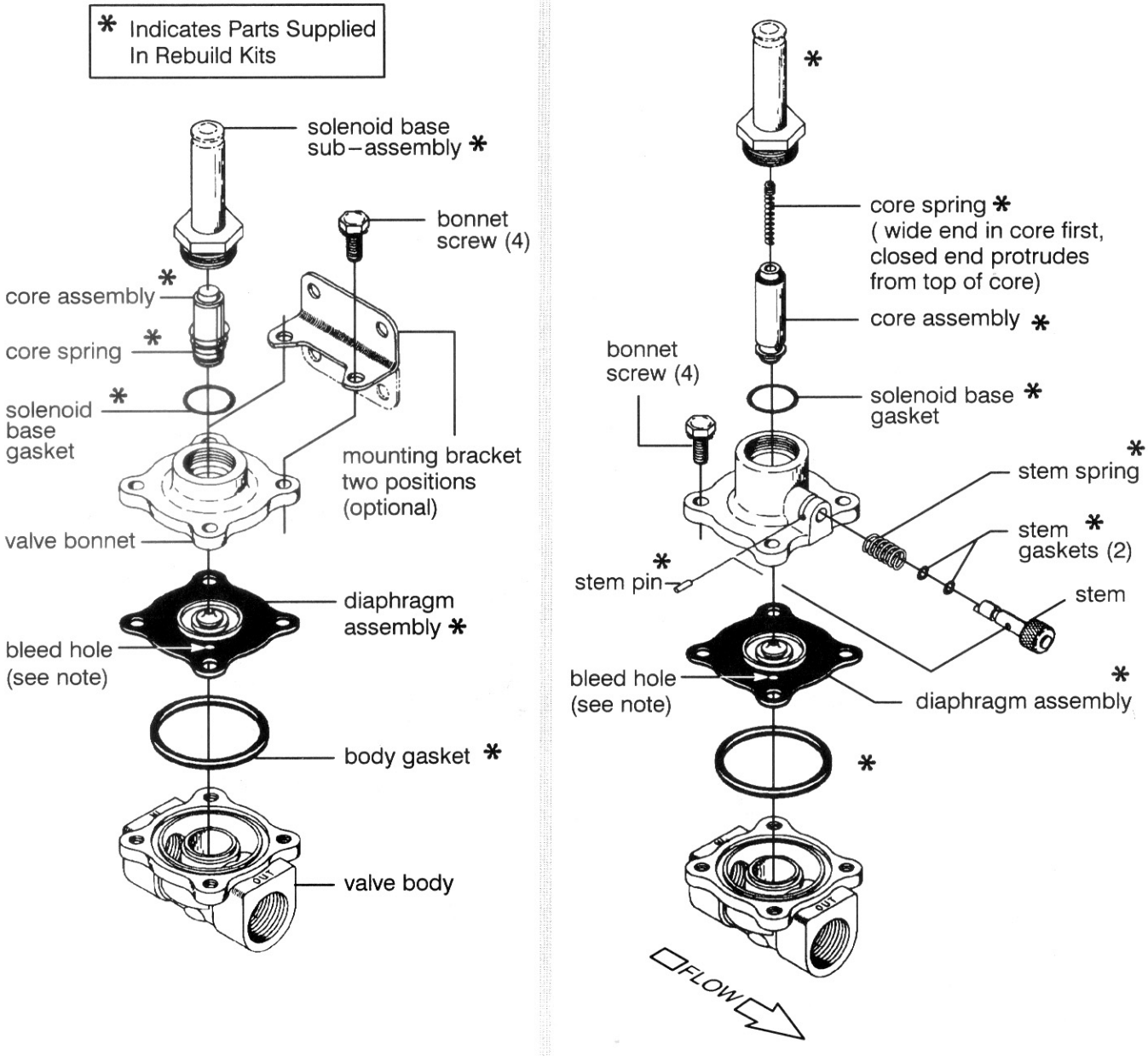

Note:
Locate bleed hole in diaphragm assembly approximately 45° from valve outlet.

Figure 3. DC construction without solenoid.

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